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(54) Round Bale Handler

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No. OF CLAIMS 50

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The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A round bale handler for use with a prime mover, comprising:

(a) a frame having a rear member;

(b) a spike having:

  (i) a pointed front end so as to readily penetrate the bale;

  (ii) a rear end pivotally connected to said frame so that said spike is swingable between a forward position parallel with the normal direction of travel of the prime mover when said frame is connected thereto, and at least one sideways position substantially 90° from the forward position;

(c) stop means mounted on said frame for releasably retaining said spike in said forward position and preventing movement thereof rearward of said sideways position;

said spike being of a sufficient length such that said spike can penetrate through an axis of the bale and extend substantially along the entire length thereof.

2. A round bale handler as described in claim 1 wherein said spike is swingable between the forward position, and opposed first and second sideways positions each substantially 90° from the forward position.

3. A round bale handler as described in claim 2 wherein said frame also has an upper guide con-

nected to the rear member of said frame and disposed above and sideways therefrom at a position above the plane in which said spike swings and between the rear and front ends of said spike, so as to provide upward support for said spike when said frame is connected to the prime mover and said spike is in the forward or sideways positions or therebetween.

4. A round bale handler as described in claim 2 wherein said frame also has a pair of spaced parallel guides connected to the rear member of said frame and disposed forward and sideways therefrom at positions adjacent respective sides of the plane in which said spike swings and between the rear and front ends of said spike, so as to provide upward and downward support for said spike when said frame is connected to the prime mover and said spike is in the forward or sideways positions or therebetween.

5. A round bale handler as described in claim 3 wherein the lower guide is semi-circular in shape.

6. A round bale handler as described in claim 4 wherein each of said guides is semi-circular in shape.

7. A round bale handler as described in claim 4 wherein the rear member includes a beam extending between opposite ends of said guides.

8. A round bale handler as described in claim

4 wherein the rear member of said frame comprises:

(a) a beam extending between opposite ends of said guides; and

(b) two brackets adapted to connect said frame to an implement on the prime mover, slidably mounted on the beam and which can be releasably positioned at any of a plurality of positions therealong.

9. A round bale handler as described in claim 6 wherein the rear member of said frame comprises:

(a) a beam extending between opposite ends of said guides; and

(b) two brackets adapted to connect said frame to an implement on the prime mover, slidably mounted on the beam and which can be releasably positioned at any of a plurality of positions therealong.

10. A round bale handler as described in claim 6 additionally comprising a wheel rotatably mounted on said spike between the guides, and wherein the guides are spaced apart a distance slightly greater than the diameter of said wheel, so that said wheel can roll freely on either guide when said spike swings.

11. A round bale handler as described in claim 9 additionally comprising a wheel rotatably mounted on said spike between the guides, and wherein the guides are

spaced apart a distance slightly greater than the diameter of said wheel, so that said wheel can roll freely on either guide when said spike swings.

12. A round bale loader as described in claim 10 wherein each of the brackets is adapted to connect to the arms of a front end loader.

13. A round bale loader as described in claim 12 wherein each of the brackets is adapted to connect to the arms of a front end loader.

14. A round bale handler as described in claim 1 wherein said stop means can releasably retain said spike in each of the forward and sideways positions.

15. A round bale handler as described in claim 3 wherein said stop means can releasably retain said spike in each of the forward and sideways positions.

16. A round bale handler as described in claim 4 wherein said stop means can releasably retain said spike in each of the forward and sideways positions.

17. A round bale handler as described in claim 6 wherein said stop means can releasably retain said spike in each of the forward and sideways positions.

18. A round bale handler as described in claim 12 wherein said stop means can releasably retain said spike in each of the forward and sideways positions.

19. A round bale handler as described in claim 14 wherein said stop means can releasably retain

said spike in each of the forward and sideways positions.

20. A method of loading and unrolling a round bale utilizing a round bale handler as described in claim 1, connected to an implement on a prime mover, comprising:

(a) penetrating the spike in an appropriate direction through the axis of the bale so that the spike extends substantially along the entire length thereof, by driving the prime mover forward while the stop means releasably retain the spike in the forward position;

(b) releasing the stop means so that the spike can swing to a sideways position;

(c) then unrolling the bale by:

  (i) turning the direction of the prime mover substantially 90° with respect to the spike while holding the bale on a surface, so that the spike is in a sideways position;

  (ii) moving the prime mover while holding the bale on the surface, so that the bale unrolls.

21. A method of loading and unrolling a round bale utilizing a round bale handler as described in claim 3, connected to an implement on a prime mover, comprising:

(a) penetrating the spike in an appropriate direction through the axis of the bale so that the spike extends substantially along the entire length thereof, by driving the prime mover forward while the stop means releasably retain the spike in the forward position;

(b) releasing the stop means so that the spike can swing to a sideways position;

(c) then unrolling the bale by:

  (i) turning the direction of the prime mover substantially 90° with respect to the spike while holding the bale on a surface, so that the spike is in a sideways position;

  (ii) moving the prime mover while holding the bale on the surface, so that the bale unrolls.

22. A method of loading and unrolling a round bale utilizing a round bale handler as described in claim 6, connected to an implement on a prime mover, comprising:

(a) penetrating the spike in an appropriate direction through the axis of the bale so that the spike extends substantially along the entire length thereof, by driving the prime mover forward while the stop means releasably retain the spike in the forward position;

(b) releasing the stop means so that the spike can swing to a sideways position;

(c) then unrolling the bale by:

  (i) turning the direction of the prime mover substantially 90° with respect to the spike while holding the bale on a surface, so that the spike is in a sideways position;

  (ii) moving the prime mover while holding the bale on the surface, so that the bale unrolls.

23. A method of loading and unrolling a round bale utilizing a round bale handler as described in claim 13, connected to an implement on a prime mover, comprising:

(a) penetrating the spike in an appropriate direction through the axis of the bale so that the spike extends substantially along the entire length thereof, by driving the prime mover forward while the stop means releasably retain the spike in the forward position;

(b) releasing the stop means so that the spike can swing to a sideways position;

(c) then unrolling the bale by:

  (i) turning the direction of the prime mover substantially 90° with respect to the spike while holding the bale on a surface, so that the spike is in a sideways position;

  (ii) moving the prime mover while holding the bale on the surface, so that the bale unrolls.

24. A method of loading and unrolling a round bale utilizing a round bale handler as described in claim 14, connected to an implement on a prime mover, comprising:

(a) penetrating the spike in an appropriate direction through the axis of the bale so that the spike extends substantially along the entire length thereof, by driving the prime mover forward while the stop means releasably retain the spike in the forward position;

(b) releasing the stop means so that the spike can swing to a sideways position;

(c) then unrolling the bale by:

  (i) turning the direction of the prime mover substantially 90° with respect to the spike while holding the bale on a surface, so that the spike is in a sideways position;

(ii) engaging said stop means so as to releasably retain the spike in the sideways position;

(iii) moving the prime mover while holding the bale on the surface, so that the bale unrolls.

25. A method of loading and unrolling a round bale utilizing a round bale handler as described in claim 15, connected to an implement on a prime mover, comprising:

(a) penetrating the spike in an appropriate direction through the axis of the bale so that the spike extends substantially along the entire length thereof, by driving the prime mover forward while the stop means releasably retain the spike in the forward position;

(b) releasing the stop means so that the spike can swing to a sideways position;

(c) then unrolling the bale by:

(i) turning the direction of the prime mover substantially 90° with respect to the spike while holding the bale on a surface, so that the spike is in a sideways position;

(ii) engaging said stop means so as to releasably retain the spike in the sideways position;

(iii) moving the prime mover while holding the bale on the surface, so that the bale unrolls.

26. A method of loading and unrolling a round bale utilizing a round bale handler as described in claim 17, connected to an implement on a prime mover, comprising:

(a) penetrating the spike in an appropriate direction through the axis of the bale so that the spike extends substantially along the entire length thereof, by driving the prime mover forward while the stop means releasably retain the spike in the forward position;

(b) releasing the stop means so that the spike can swing to a sideways position;

(c) then unrolling the bale by:

(i) turning the direction of the prime mover substantially 90° with respect to the spike while holding the bale on a surface, so that the spike is in a sideways position;

(ii) engaging said stop means so as to releasably retain the spike in the sideways position;

(iii) moving the prime mover while holding the bale on the surface, so that the bale unrolls.

27. A method of loading and unrolling a round bale utilizing a round bale handler as described in claim 19, connected to an implement on a prime mover, comprising:

(a) penetrating the spike in an appropriate direction through the axis of the bale so that the spike extends substantially along the entire length thereof, by driving the prime mover forward while the stop means releasably retain the spike in the forward position;

(b) releasing the stop means so that the spike can swing to a sideways position;

(c) then unrolling the bale by:

(i) turning the direction of the prime mover substantially 90° with respect to the spike while holding the bale on a surface, so that the spike is in a sideways position;

(ii) engaging said stop means so as to releasably retain the spike in the sideways position;

(iii) moving the prime mover while holding the bale on the surface, so that the bale unrolls.

CLAIMS SUPPORTED BY SUPPLEMENTARY DISCLOSURE

I CLAIM:

28. A round bale handler for use with a prime mover, comprising:

- (a) a frame having a rear member;
- (b) a spike having:
    - (i) a pointed front portion so as to readily penetrate the bale;
    - (ii) a rear portion pivotally connected to said frame so that said spike is swingable between a forward position parallel with the normal direction of travel of the prime mover when said frame is connected thereto, and at least one sideways position substantially 90° from the forward position:
- (c) stop means mounted on said frame for releasably retaining said spike in the forward position and preventing movement thereof rearward of the sideways position;

said spike being of a sufficient length such that the forward portion thereof can penetrate through an axis of the bale and extend substantially along the entire length thereof.

29. a round bale handler as described in claim 28 additionally comprising:

(a) A bale keeper moveable along the rear portion of said spike, and extending radially therefrom so as to restrain rearward movement of a bale on the front portion of said spike and which abuts said bale keeper;

(b) a keeper retainer positioned and constructed so as to releasably retain said bale keeper in an extended and a retracted position along the rear portion of said spike, in either of which a bale can be retained on said spike abutting said bale keeper.

30. A round bale handler as described in claim 28 additionally comprising a support arm pivotally connected to an upper end of said frame, and extending and connected to, the rear portion of said spike, so as to provide upward and downward support for said spike.

31. A round bale handler as described in claim 29 additionally comprising a support arm pivotally connected to an upper end of said frame, and extending and connected to, the rear portion of said spike, so as to provide upward and downward support for said spike, and wherein the extended and retracted positions of said bale keeper are forward of said support arm, and said spike is swingable between the forward position and opposed first and second sideways positions each substantially 90° from the forward position.

32. A round bale handler as described in claim 31 wherein the retracted position is adjacent a forward end of said support arm.

33. A round bale handler as described in claim 32 wherein said bale keeper extends below said spike a distance less than that which it extends above and sideways of said spike, and which has a lower upcurving edge.

34. A round bale handler as described in claim 32 wherein said bale keeper is in the form of a plate, which has at least one sighting opening therethrough, so that when the handler is connected to the prime mover and a bale is positioned on the front portion of said spike, an operator on the prime mover can observe the position of the bale through the sighting opening.

35. A round bale handler as described in claim 32 wherein said keeper retainer comprises:

(i) a sleeve slidably mounted on the rear portion of said spike and connected to a rear side of said bale keeper to slide therewith, and having a flange extending at least part way therealong;

(ii) a bracket connected to said support arm;

one of the flange and the bracket having a plurality of holes therealong, while the other one thereof has at least one hole therein which is alignable with the holes in the one, so that a pin can be received between such aligned holes.

36. A round bale handler as described in claim 29

wherein said frame comprises two brackets connected to a rear end of said frame and adapted to connect said frame to different sized implements on the prime mover, and which brackets can be releasably positioned at any of a plurality of positions along the rear end of said frame.

37. A round bale handler as described in claim 31 wherein said frame comprises two brackets connected to a rear end of said frame and adapted to connect said frame to different sized implements on the prime mover, and which brackets can be releasably positioned at any of a plurality of positions along the rear end of said frame.

38. A round bale handler as described in claim 33 wherein said frame comprises two brackets connected to a rear end of said frame and adapted to connect said frame to different sized implements on the prime mover, and which brackets can be releasably positioned at any of a plurality of positions along the rear end of said frame.

39. A round bale handler as described in claim 37 wherein each of the brackets comprises two sections independently slidable toward and away from one another along the rear end of said frame, so that each of said brackets can connect to each of a plurality of various width arms of respective implements.

40. A round bale handler as described in claim 38 wherein each of the brackets comprises two sections independently slidable toward and away from one another along the rear end of said frame, so that each of said brackets can

connect to each of a plurality of various width arms of respective implements.

41. A round bale handler as described in claim 31 wherein said stop means can releasably retain said spike in each of the forward and sideways positions.

42. A round bale handler as described in claim 38 wherein said stop means can releasably retain said spike in each of the forward and sideways positions.

43. A round bale handler as described in claim 28 wherein said spike is swingable between the forward position, and opposed first and second sideways positions each substantially 90 from the forward position, and wherein said stop means is for preventing movement of said spike rearward of the first and second sideways position.

44. A method of loading and unrolling a round bale utilizing a round bale handler as described in claim 29, connected to an implement on a prime mover, which method comprises:

(a) initially positioning said bale keeper in the retracted position and releasably retaining it therein with said keeper retainer;

(b) penetrating the spike in an appropriate direction through the axis of the bale so that the front portion of the spike extends substantially along the entire length thereof and the bale abuts said bale keeper, by driving the prime mover forward position;

(c) transporting the bale on the front portion of said spike, to another location by moving the prime mover;

(d) then:

  (i) first moving the round bale handler backward so that a rear end of the bale is adjacent the extended position of said bale keeper; then

  (ii) moving said bale keeper to the extended position so as to abut the bale; and

  (iii) adjusting said stop means so that said spike can swing to the sideways position to be restrained from further rearward movement therefrom by said stop means;

(e) then unrolling the bale by :

  (i) turning the direction of the prime mover substantially 90 with respect to said spike so that said spike is in the sideways position and prevented from movement rearward thereof by said stop means;

  (ii) moving the prime mover while holding the bale on a surface, so that the bale unrolls.

45. A method of loading and unrolling a round bale utilizing a round bale handler as described in claim 31, connected to an implement on a prime mover, which method comprises:

(a) initially positioning said bale keeper in the retracted position and releasably retaining it therein with said keeper retainer;

(b) penetrating the spike in an appropriate direction through the axis of the bale so that the front portion of the spike extends substantially along the entire length thereof and the bale abuts said bale keeper, by driving the prime mover forward while said stop means releasably retains said spike in the forward position;

(c) transporting the bale on the front portion of said spike, to another location by moving the prime mover;

(d) then:

  (i) first, moving the round bale handler backward so that a rear end of the bale is adjacent the extended position of said bale keeper; then

  (ii) moving said bale keeper to the

extended position so as to abut the bale; and

(iii) adjusting said stop means so that said spike can swing to the first sideways position to be restrained from further rearward movement therefrom by said stop means;

(e) then unrolling the bale by :

(i) turning the direction of the prime mover substantially 90 with respect to said spike so that said spike is in the first sideways position and prevented from movement rearward thereof by said stop means;

(ii) then moving the prime mover while holding the bale on the surface so that the bale unrolls.

46. A method of loading and unrolling a round bale utilizing a round bale handler as described in claim 33, connected to an implement on a prime mover, which method comprises:

(a) initially positioning said bale keeper in the retracted position and releasably retaining it therein with said keeper retainer;

(b) penetrating the spike in an appropriate direction through the axis of the bale so that the front protion of the spike extends substantially along the entire length thereof and the bale abuts said bale keeper, by driving the prime mover forward while said stop means releasably retains said spike in the forward position;

(c) transporting the bale on the front portion of said spike, to another location by moving the prime mover;

(d) then:

  (i) first, moving the round bale handler backward so that a rear end of the bale is adjacent the extended position of said bale keeper; then

  (ii) moving said bale keeper to the extended position so as to abut the bale; and

  (iii) adjusting said stop means so that said spike can swing to the first sideways position to be restrained from further rearward movement therefrom by said stop means;

(e) then unrolling the bale by:

  (i) turning the direction of the prime mover substantially 90 with respect to said spike so that said spike is in the first sideways position and prevented from movement rearward thereof by said stop means;

(ii) then moving the prime mover while holding the bale on the surface so that the bale unrolls.

47. A method as described in claim 45 wherein the bale is penetrated in a direction such that the bale can be unrolled in a direction reverse of that in which it is rolled, and wherein the bale is first partially unrolled in step (e) in such reverse direction, the method additionally comprising following step (e):

(f) adjusting said stop means so that said spike can swing from the first to the second sideways position to be restrained from further rearward movement therefrom by said stop means;

(g) then further unrolling the bale, in the direction in which it is rolled, by:

(i) turning the direction of the prime mover substantially 180 with respect to said spike so that said spike is in the second sideways position, and prevented from movement rearward thereof by said stop means;

(ii) then moving the prime mover while

holding the bale on the surface so that the bale unrolls in the direction in which it is rolled.

48. A method of loading and unrolling a round bale utilizing a round bale handler as described in claim 28, connected to an implement on a prime mover, comprising:

(a) penetrating the spike in an appropriate direction through the axis of the bale so that the front portion of said spike extends substantially along the entire length thereof, by driving the prime mover forward while said stop means releasably retains the spike in the forward position;

(b) adjusting said stop means so that said spike can swing to the sideways position to be restrained from further rearward movement therefrom by said stop means;

(c) then unrolling the bale by:

  (i) turning the direction of the prime mover substantially 90 with respect to said spike, so that said spike is in the sideways position and prevented from movement rearward thereof by said stop means;

  (ii) moving the prime mover while holding the bale on a surface, so that the bale unrolls.

49. A method of loading and unrolling a round bale utilizing a round bale handler as described in claim 43, connected to an implement on a prime mover, comprising:

(a) penetrating the spike in an appropriate direction through the axis of the bale so that the front portion of said spike extends substantially along the entire length thereof, by driving the prime mover forward while said stop means releasably retain the spike in the forward position;

(b) adjusting said stop means so that said spike can swing to the first sideways positions, to be restrained from further rearward movement therefrom by said stop means;

(c) then unrolling the bale by:

  (i) turning the direction of the prime mover substantially 90 with respect to said spike, so that said spike is in the first sideways position;

  (ii) moving the prime mover while holding the bale on a surface, so that the bale unrolls.

50. A method of loading and unrolling a round bale utilizing a round bale handler as described in claim 45, connected an implement on a prime mover, comprising:

(a) penetrating the spike in an appropriate direction through the axis of the bale so that the front portion of said spike extends substantially along the entire length thereof, by driving the prime mover forward while said stop means releasably retains the spike in the forward position;

(b) adjusting said stop means so that said spike can swing to the first sideways position, to be restrained from further rearward movement therefrom by said stop means;

(c) then unrolling the bale by:

  (i) turning the direction of the prime mover substantially 90 with respect to said spike, so that said spike is in the first sideways position;

  (ii) adjusting said stop means so as to releasably retain the spike in the first sideways position;

  (iii) moving the prime mover while holding the bale on a surface, so that the bale unrolls.

*

ABSTRACT OF THE DISCLOSURE

A round bale handler comprises a frame with a rear member, and a spike. Spike has a pointed front end to penetrate the round bale, and a rear end pivotally connected to the frame so that the spike is swingable between forward and sideways positions. The spike is of a sufficient length such that it can penetrate through the axis of the bale and extend substantially along the entire length of it. Stop means are provided for releasably retaining the spike in the forward position and preventing it from swinging beyond each sideways position. Preferably a pair of spaced parallel guides are provided as part of the frame, which are connected to the rear member of the frame and provide upward and downward support for the spike when the frame is connected to the prime mover and the spike is in the forward or sideways positions or therebetween. Furthermore a wheel is usefully rotatably mounted on the spike between the guides, with the guides being spaced apart a distance slightly greater than the diameter of the wheel, so that the wheel can roll freely on either guide when the spike swings during use of the device.

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Fig. 1.

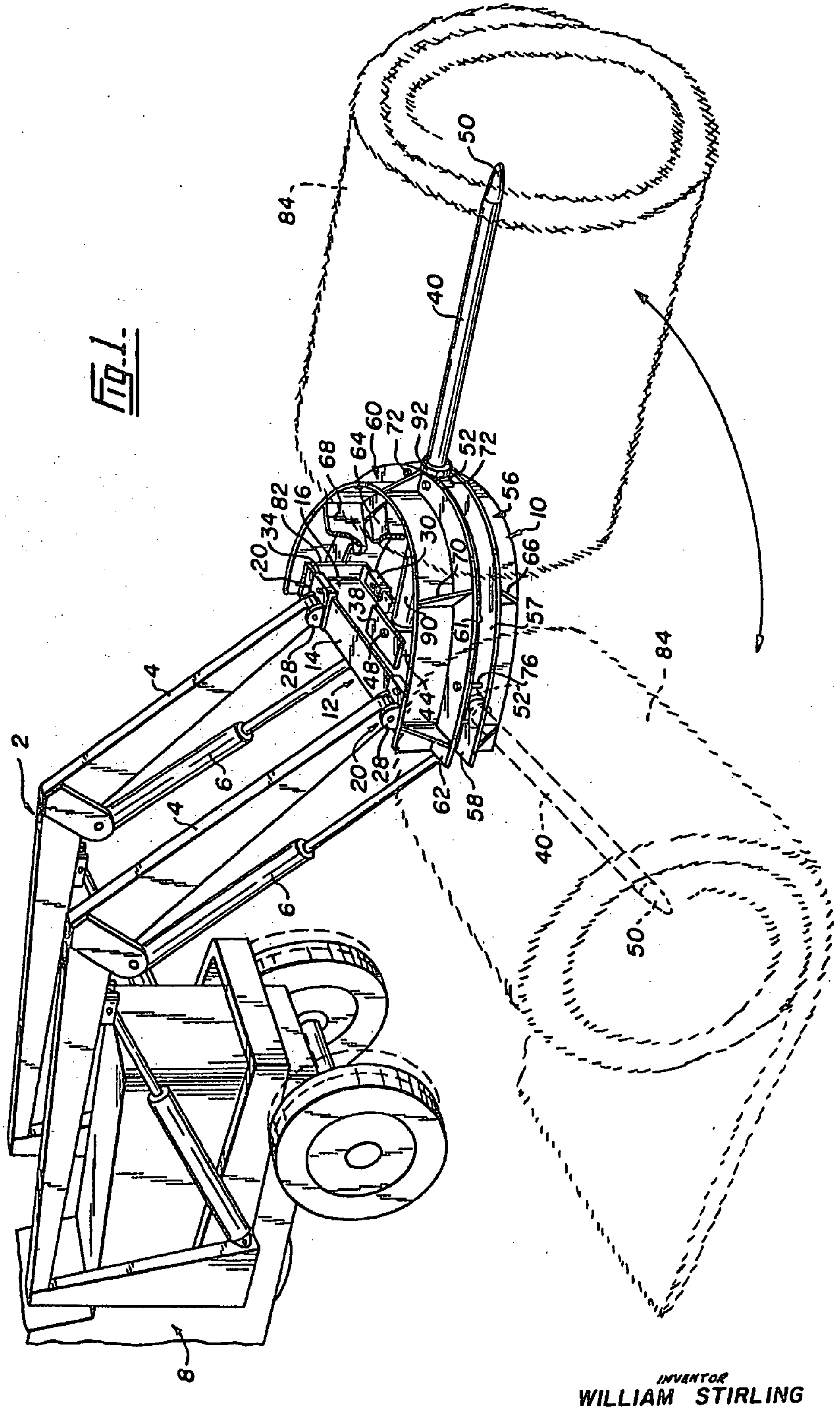

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Fig. 2.

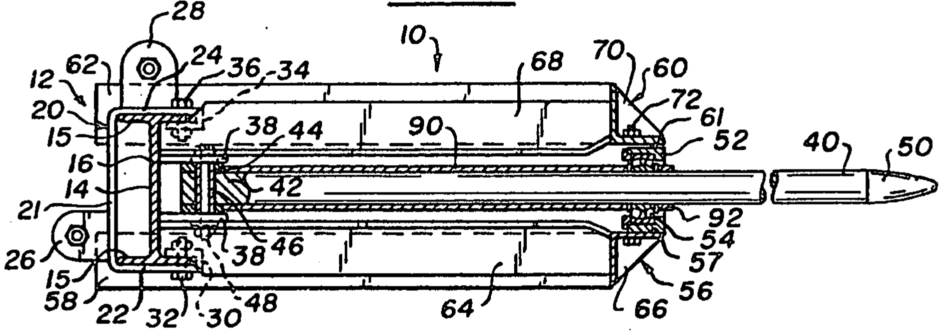

Fig. 3.

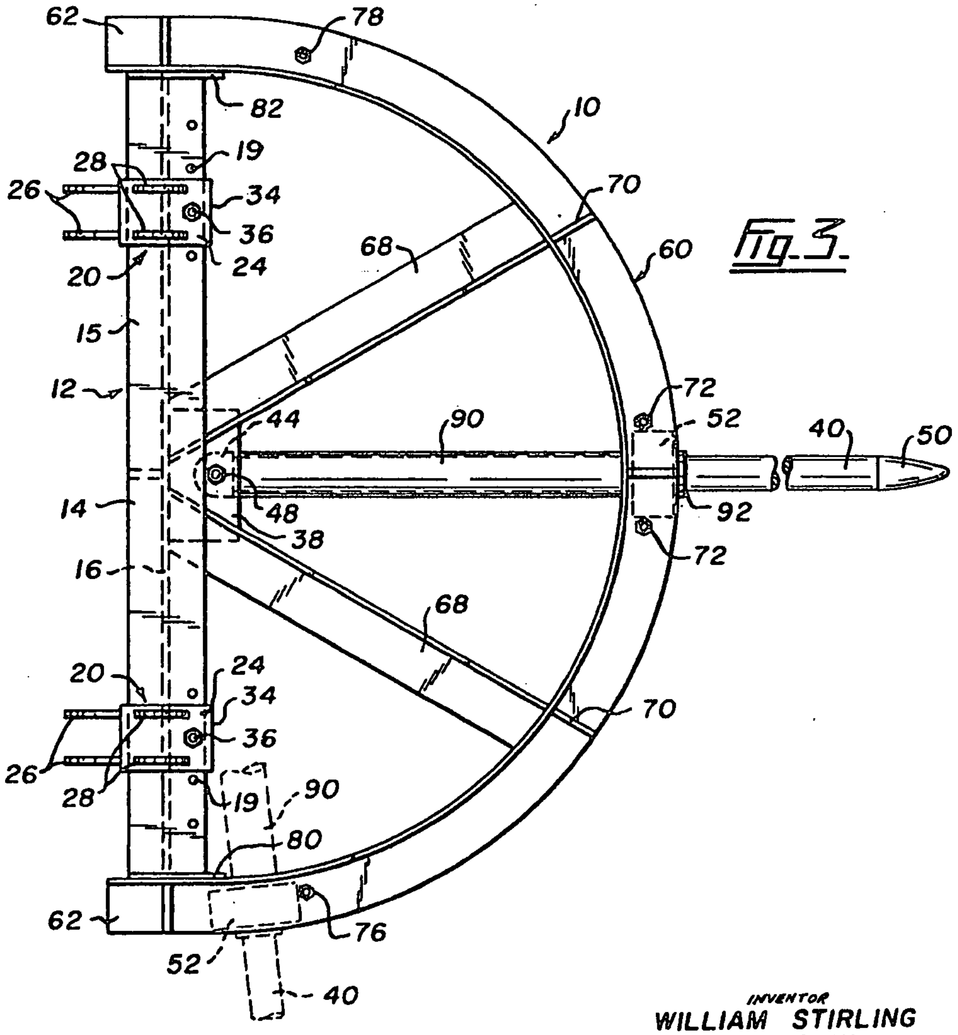

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FIG. 4.

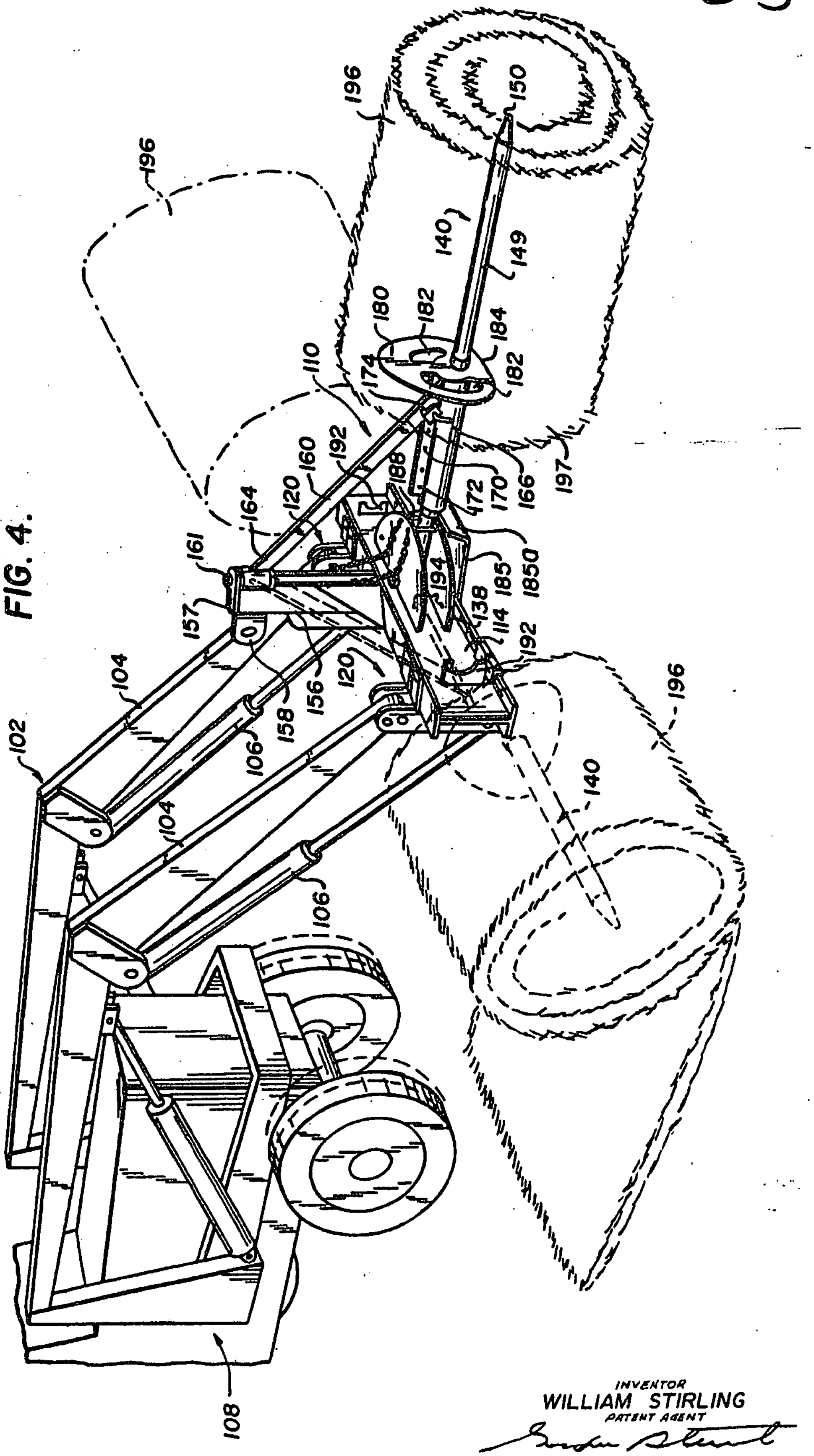

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FIG. 5.

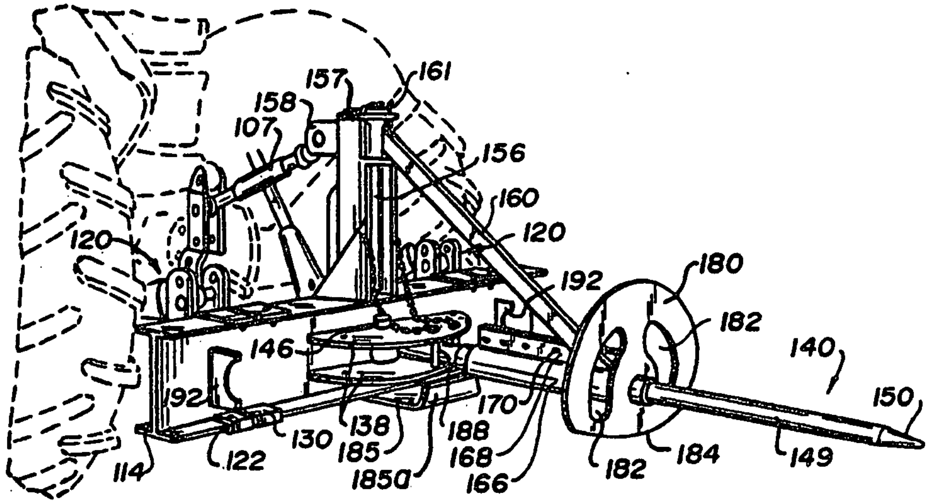

FIG. 6.

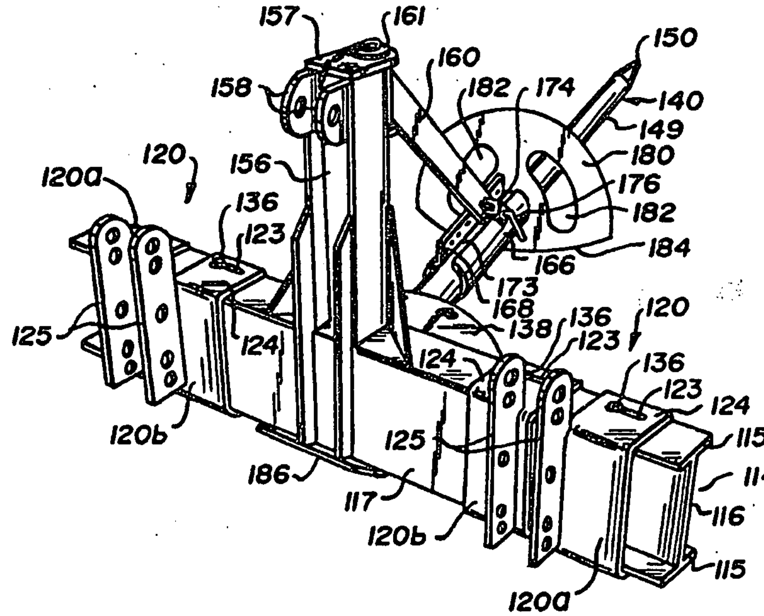

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FIG. 7.

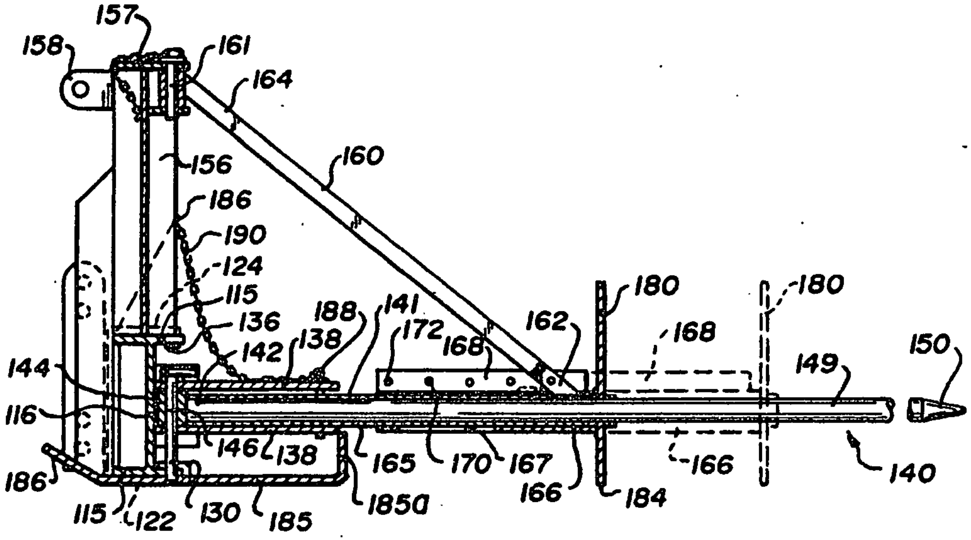
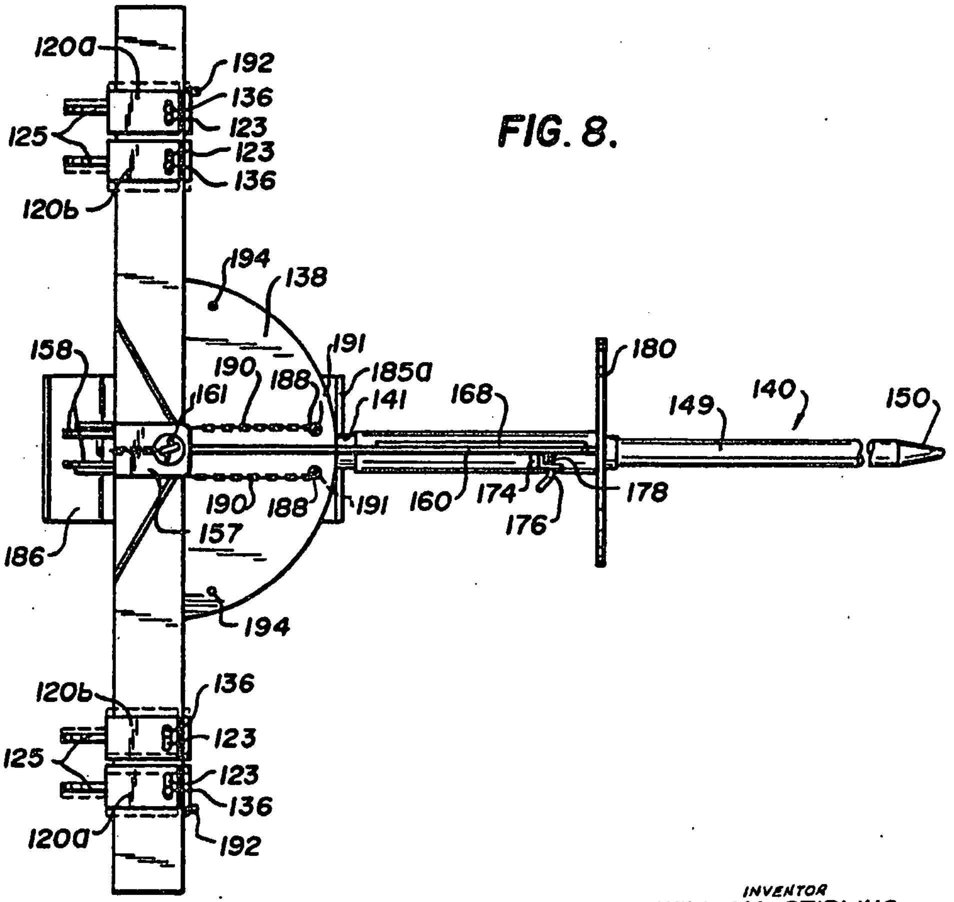


FIG. 8.



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